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Primary analysis of the Mandarin-speaking sub-study within the Sydney diabetes prevention program

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ABSTRACT

Aim: There is strong and consistent evidence from large scale randomised controlled trials that type 2 diabetes can be prevented or delayed through lifestyle modification which improves diet quality, increases physical activity and achieves weight loss in people at risk. Worldwide, the prevalence of type 2 diabetes is increasing in individuals of Chinese descent. Culturally tailored programs are required to address the risk in the Chinese population. This paper analyses effectiveness of a culturally tailored community-based lifestyle modification program (Sydney Diabetes Prevention Program (SDPP)) targeting Mandarin speakers.

Aim: The SDPP was a 12 month translational study aiming to promote increased physical activity and dietary changes. Effectiveness was assessed through the improvement of anthropometric, metabolic, physical activity and dietary outcomes and number of goals met.

Methods: Seventy-eight Mandarin-speaking participants at a high risk (Australian Diabetes Risk, AUSDRISK $\geq$ 15) of developing diabetes were recruited for this study.

Results: In this cohort, waist circumference, total cholesterol and fat intake significantly improved at the 12-month review. In comparison to the English-speaking stream, the Mandarin-speaking stream achieved fewer improvements in outcomes and goals.

Abbreviations: SDPP, Sydney Diabetes Prevention Program; PA, physical activity; WC, waist circumference; FPG, fasting plasma glucose; LOs, lifestyle officers; GPs, general practitioners; AUSDRISK, Australian Diabetes Risk; CATI, computer assisted telephone interview; PASE, Physical Activity Scale for the Elderly; PAQ, Paffenbarger Activity Questionnaire; BMI, body mass index

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Conclusion: The SDPP was not effective in reducing the risk factors associated with developing type 2 diabetes in this cohort of high risk Mandarin-speaking individuals living in Sydney.

1. Introduction

The risk of type 2 diabetes in individuals of Chinese descent is higher than individuals of European descent due to ethnic and genetic predispositions [1]. The rapid rise in diabetes prevalence in China has resulted in the call for preventive strategies [2]. In 2014–2015, 2% of the Australian population was born in China making it the third highest population by country of birth living in Australia [3]. With the Chinese migration rate increasing [4], the genetic predispositions may increase the burden of diabetes within the Australian health system.

Individuals of Chinese descent are a vulnerable population group. In addition to the predisposition for increased risk of developing type 2 diabetes, language barriers may prevent individuals from accessing health services [5], indicating the need to tailor preventive programs specifically to Chinese individuals. The largest diabetes prevention study among Chinese people was the Da Qing study in 1997 [6] that followed individuals for two decades [7]. Although the original study reduced the risk of diabetes by 40%, the intervention effect waned after 14 years [7] and the prevalence of diabetes has continued to rise in China and is projected to increase in the near future [8]. Community translational studies in other countries have attempted to replicate similar results in clinical practice including numerous diabetes prevention programs [9–15]. The large-scale nature of translational studies restricts the intensity of interventions in order to improve practical affordability; however the challenge to maintain intervention effectiveness arises [16,17]. As Mandarin is the most common non-English language spoken at home in Australia [18], a 12 month translational study conducted in Sydney, Australia, known as the Sydney Diabetes Prevention Program (SDPP), was translated entirely into Mandarin and delivered to Chinese people living in Sydney to promote increased physical activity (PA) and dietary changes [19].

The SDPP was designed to evaluate the effectiveness and cost-effectiveness of lifestyle modification interventions through the promotion of five goals: increasing amount of moderate to vigorous intensity aerobic (150 min/week) and progressive resistance training (60 min/week) to 210 min/week; reducing percent total energy from fat and saturated fat intake to less than 30% and 10%, respectively; consuming at least 15 g/1000 kcal of dietary fibre intake; and reducing body weight by 5% after 12 months [19]. The SDPP included three streams; one mainstream program with English-speaking participants and two culturally and linguistically diverse streams with Arabic- and Mandarin-speaking participants. The results of the English-speaking stream has been published previously [20], and showed statistically significant improvements in weight, waist circumference (WC), dietary intake, PA level and all metabolic outcomes, except fasting plasma glucose (FPG) as well as a statistically significant increase in number of participants achieving the three nutrition goals but not PA goal [20]. This paper presents the findings of the Mandarin-speaking stream. We aimed to determine the effectiveness of the SDPP through the change in measured outcomes and goals achieved at 12 months.

2. Materials and methods

The SDPP was a 12 month lifestyle modification program conducted in the greater Sydney area [19,20]. This analysis focuses on Mandarin-speaking Chinese individuals aged between 50 and 65 years who had an Australian Diabetes Risk (AUSDRISK) score ≥15. In addition to the exclusion criteria for the English-speaking stream, participants who were fluent in English were excluded from this sub-study [19].

The program was adapted for the Mandarin-speaking stream through consultations with an Advisory Group to ensure culturally appropriate changes were made [21]. These modifications included conducting the program entirely in Mandarin, translating all resources and materials to Mandarin, having two bilingual lifestyle officers (LOs) involved in the study and ensuring more culturally appropriate options for dietary modifications and PA.

2.1. *Program outline*

Details of the intervention have been reported previously [19]. Briefly, 16 Mandarin-speaking general practitioners (GPs) practicing within the Central Sydney General Practice Network were recruited for the study and trained by bilingual LOs prior to screening potential participants. The two bilingual LOs included a dietitian and an exercise physiologist that were trained in health coaching, group program delivery and standardised data collection used for evaluation [19]. Chinese individuals were screened and referred to this study by their GP. As part of the screening and referral process, GPs administered the AUSDRISK assessment tool [22] to determine the person's risk of developing diabetes within five years. All individuals at high risk had blood tests to exclude undiagnosed diabetes. Those without undiagnosed diabetes who were medically cleared by their GPs were referred to the study.

After enrolment into the study, a computer assisted telephone interview (CATI) survey was completed with participants before they met with LOs for a 1.5-h individual initial consultation. Following this, three 2-h lifestyle group sessions were conducted by LOs. Three follow-up health coaching phone calls, lasting 20–30 minutes each, were conducted at